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DISEASES OF THE CHEST

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THIS DAY commemorates the birth of one who was created in love. His existence on earth was dedicated to a continuance of that love. During his brief stay here his servitude was one of deep loyalty to ideals, which, filled with forgiveness, sought to enlighten wavering masses. His spirit, embodied in such teachings, continues to soothe the hearts of those who surround us. Mayhaps this Christmastide will bring you that contentment.

Benjamin Goldberg, M.D.

Editorial Comment

Christmas Seals Sale Thirty-seven years ago in the small country of Denmark, a spark was ignited, gradually kindled into a wee flame; and now today, has become a mighty blaze which annually sweeps across the several nations. It is the Christmas Seals Sale campaign for the fight against Tuberculosis. The story of its origin in the small office of a Danish postal clerk, and its subsequent transplantation to, and its flourishing growth in this country, has often been told. The increasing success of this annual campaign is now making history; and the prediction for this year forecasts the most glowing one of this brilliant record.

It is a humanitarian campaign and coming now, as it does, in a world bathed in blood and despair, it stands out as one of the few gleaming beacons to which civilization can point with pride. This is all the more reason why everyone interested in the finer things of life, interested in constructive rather than destructive forces, should unite in an enthusiastic support of the Tuberculosis Christmas Seals Sale. It will be sorely needed when this bruised, battered and bewildered world emerges from the chaos and strife which now enshroud it.

The funds raised by the Christmas Seals Sale are used to combat Tuberculosis — the scourge that still remains the greatest killer in life's most productive age periods. They go to the support of the national, state, and local Tuberculosis organizations. Ninety-five per cent of Seals Sale funds remains in the state or local area where they are sold. They provide the means for that important part of our armament—*public education*. While a poll, a year or so ago, revealed the rather startling ignorance of the public as a whole regarding Tuberculosis, this does not mean that education has been a failure. It, rather, emphasizes the need for more intensified efforts in this field. The funds have been used to demonstrate the need for hospitals, clinics, nurses and other agencies for the control of Tuberculosis. The frequently repeated association of the seals with the tuberculosis fight has served to make the public more tuberculosis conscious and has stimulated an interest in a need for their donated dollars.

On November 24th, the Thirty-fifth Annual Christmas Seals Sale Campaign was set in motion. It is a campaign which should receive the hearty support of the medical profession down to the man, and a campaign for which every man in the profession should consider himself a committee of one to further its progress. So, physicians, here, there and everywhere, rally to the support of this worthy cause; crusade under the banner of the double-barred cross, and carry on this fight with an undiminished fervor. Let every doctor's office be a *Seals Sale booth!*

C. H. H.

Evaluating Chest Surgery With the recent development of many new chest surgical procedures, there have been diverse and conflicting reports as to the value of these procedures. This has been seen principally in the statistical compilations as to end results of the operation under discussion. The enthusiast, in the practice of medicine, with his keen imagination develops new procedure, but the conservative awaits the results and carefully assays these before extending new methods to those patients under his supervision. One must remember that enthusiasm, the ability to properly select certain types of pathology for certain operation, technical skill and perseverance often determine the end result. In many procedures, such judgment and skill may only come after several years of persistence in developing an adequate technique. We should not be hasty in approving or condemning new operative procedure, early failure or later seemingly unusually fine results. It behooves us rather to investigate and to study with those who are competent. It is only natural that the discoverer of a new procedure will usually give, in addition to his enthusiasm, careful attention to proper selection of patients, will have a technical skill and observe the detail of postoperative management which in his hands will give better results than one who has not the same interest. This article has been stimulated by the various discussions that have arisen and have been centered on such procedure as the

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The Management of Fluids Complicating Pneumothorax*

DEAN B. COLE, M.D., *and* WALTER L. NALLS, M.D.
Richmond, Virginia

It is generally agreed by most observers that pleural effusion is the most frequent complication of pneumothorax and occurs in 50 to 90 per cent of patients sometime during the course of this treatment. While massive effusions may be troublesome, and while purulent effusions may be serious and sometimes fatal; the majority of effusions are only incidental. In our experience most patients show some fluid sometimes during the course of treatment, but more than one-half of these are small in amount, symptomless, transient, and normally only discovered by routine fluoroscopy or x-ray. Most of these require no treatment unless a diagnostic thoracentesis shows a cloudy fluid which demands special consideration. Since many empyemas appear suddenly, and are small in amount often producing no early symptoms and discovered only by diagnostic thoracentesis following fluoroscopy, we believe this procedure should be routine whenever fluid appears.

A clear fluid, small in amount and transient, requires no further consideration. Should the fluid persist, even though small in amount, it should be removed sufficiently often to maintain a relatively dry pleura, since even persisting small effusions may produce adhesions or other undesirable sequelae. Larger effusions should always be completely aspirated and replaced with sufficient air to maintain adequate collapse with an optimun intrapleural pressure. When this type of effusion occurs, it may become desirable or necessary to aspirate more frequently than the accustomed pneumothorax refill interval. If this program is followed, the development of massive effusions can usually be avoided. Some observers feel that fluid is beneficial and should be removed only for symptomatic relief of dyspnea. Others believe that fluid may be beneficial in cavity closure, and because of its weight especially beneficial in improving an inadequate collapse. In our opinion, the disadvantages of fluid such as mediastinal pressure, the development of adhesions—mediastinal, diaphragmatic or pericardial—and often an obliterative pleuritis, outweigh any possible good effect to be obtained from the presence of fluid. In addition to the usual culture of pleural fluids we have for the past eight years made a routine culture for tubercle bacilli. Routine fluid cultures show the presence of the bacilli in approximately 85 per cent of fluids complicating therapeutic pneumothorax in our practice. As a control we have had a number of idiopathic spontaneous pneumothoraces with fluid which showed no tubercle bacilli on culture. Because of the almost constant presence of tubercle bacilli in pleural fluid complicating therapeutic pneumothorax in tuberculous patients, the continued presence of fluid is always a hazard and a potential menace in the development of empyema. We have found fluid useful in fixing a mobile mediastinum and we not infrequently find it desirable to temporarily produce fluid for this purpose. Even when fluid is intentionally produced only a short time is necessary to produce adhesions, and when this is accomplished, if the fluid has not been absorbed, it should be promptly removed.

Many authors stress the desirability of and often the necessity for bed rest in the treatment of pleural effusion. Our experience with an ambulatory pneumothorax clinic for the past several years, convinces us that this is unnecessary as a routine procedure. We utilize bed rest in the presence of fever or other symptoms, but only for the relief of these symptoms and not with the belief that it has any direct influence on the appearance or course of the effusion. During the past twelve years there has been no patient unable because of fluid, to come to the office for treatment.

By fluoroscopy we determine the dependent point of the fluid and the best location for insertion of the needle, marking the skin under fluoroscopic observation with patient in position for aspiration. We usually aspirate patient in upright position, but sometimes

* Read before the meeting of the American College of Chest Physicians, Cleveland, May 31, 1941.

find it desirable to utilize other posture for more complete emptying. An ordinary eighteen or twenty gauge needle is used with a 10 or 20 c.c. syringe, and ordinarily we use the one needle method, although sometimes find the two-needle method preferable. We have a number of gadgets which are used on special occasion where a large quantity of fluid must be withdrawn, but for ordinary puropses we find the syringe method preferable to all others. Precaution against trauma to tissue, rib, pleural and lung should be observed. With reasonable care, fluid may be removed and replaced with air without pain or risk.

Tuberculosis empyema may complicate pneumothorax at any stage of treatment. It may develop suddenly with or without symptoms, or may slowly appear in a fluid which was previously clear. For purposes of this discussion, we may consider as tuberculous empyema, any cloudy fluid containing tubercle bacilli, and complicating pneumothorax. In our practice approximately 10 per cent of patients receiving therapeutic pneumothorax conform to this definition. Our treatment of this complication in the main is that of clear effusions, but is more active and more energetic. All turbid fluid is completely removed and the pleura is usually irrigated with normal saline solution until this returns clear. This is repeated daily until the fluid clears or until it becomes sufficiently chronic that we feel safe in removing it at less frequent intervals. The use of gentian violet, azochloramid or other antiseptics is dependent upon a number of factors such as bacteriology of the fluid, its appearance, and the response of the patient to aspiration and irrigation. We have used azochloramid rather extensively, and less frequently gentian violet and other dyes, and have even tried sulfanilamide solution for irrigation. Although effective for secondary infections, none of these have retarded the growth of the tubercle bacillus. We feel that if tuberculous empyema is treated early, persistently and adequately by aspiration and irrigation, with or without antiseptic instillation, as indicated, there will be relatively few cases requiring surgical aid. All observers recognize that regardless of treatment some patients may develop bronchopleural fistula and in some instances, because of previously formed adhesions and pleural thickening, the lung is immobile and cannot be re-expanded. Persistent tuberculous infection of the walls of an empyema may resist treatment and also because of excessive scar tissue, the fistulous tracts communicating with neighboring structures such as infected ribs, cartilage, sternum, spine or suppurating mediastinal lymph glands would continue to feed the empyema unless and until the focus is removed. These complications demand surgical intervention.

Pleurocutaneous sinus resulting from an infected needle tract is often referred to as one of the serious complications of tuberculous empyema, and is frequently advanced as an argument against repeated aspiration. This occurred in three of our patients, but has not been troublesome since in all three this disappeared promptly without recurrence. Needle tract infections result from repeated needling in the same location, and can be avoided by frequent change of site of puncture, and by diligent care in cleaning needle with saline solution before withdrawal.

Some authors report good results with oleothorax, replacing both the pus and air with an oil, thus obviating the necessity for other treatment. This sometimes is used as a palliative measure for symptomatic relief until ill patients are sufficiently improved for thoracoplasty or other surgical treatment. It is also used as a semi-permanent or even permanent collapse measure. Our experience with this procedure is limited, and our results do not justify an evaluation of its merit.

The entire management of pleural effusions complicating pneumothorax therapy is one of individualization and judgment. We believe the principle of pneumothorax is sound and that the complications such as pleural effusions are largely incidental, also that the empyemas which are more serious are relatively infrequent; and the severe or fatal empyemas fortunately are not common. In order to properly evaluate the risk, it is necessary in treating these complications to constantly keep in mind the condition of the patient and endeavor to determine the necessity for maintaining collapse or the desirability for changing the method of collapse. Should empyema develop in a patient with a pneumonic cavernous tuberculosis, recently collapsed by pneumothorax, an effort should be made to maintain an adequate collapse of the lung while treating the empyema as a

troublesome complication. As opposed to this, if the collapse is of long standing and the lung virtually healed, the empyema should be given first consideration and if possible the lung coaxed to re-expand or the volume of the thoracic cage decreased to obliterate the dead space. The question of the use of phrenicectomy, either temporary or permanent, and the value of thoracoplasty must be individualized and used in accordance with both the purpose and need for partial, temporary, or permanent collapse. Empyemas with a mixed infection which do not respond to energetic treatment with aspiration and irrigation may necessitate either closed or open drainage. Rarely a rapidly forming pure tuberculous empyema producing profound toxic symptoms, may justify surgical drainage either open or closed. Because of the remaining pleurocutaneous fistula which is always troublesome and is usually resistant to cure, we feel that surgical drainage should be used only as a last resort or as an emergency measure.

Tuberculosis in the Next Decade—A Prediction*

LOUIS I. DUBLIN, Ph.D.**
New York, New York

We who have participated in the campaign against tuberculosis in the past thirty years, can review the record with considerable satisfaction. Less than a generation ago, tuberculosis held uncontested leadership among the causes of death; today, it is in seventh place and if we consider coronary disease a separate entity, as some do, then it is in eighth place. The decline in mortality has been 70 per cent. In spite of the economic depression, the last decade alone has witnessed a decline of nearly 40 per cent in the tuberculosis death rate. If the rate at the turn of the century had continued to prevail, the disease would have taken well over a quarter of a million lives in this country last year, instead of the less than 60,000 that actually occurred. On the score of morbidity, the picture is probably as favorable. We do not definitely know what has happened with reference to cases. But we do know that there has been an enormous decrease in the number of positive reactors as is indicated by mass tests and surveys made in the more advanced communities. The achievement in life conservation through control of tuberculosis is outstanding in the annals of preventive medicine.

It is difficult to overestimate the value of these epic gains for the nation's social and economic advantage. Nor have these gains been limited to any particular group in the population. Men, women and children, white and Negro, at all ages of life, and of all economic classes, have profited by the retreat of tuberculosis. I can speak feelingly with regard to one large group whom I have had the honor and privilege to observe uninterruptedly over a period of thirty years. These are the many millions of men, women and children who constitute the Industrial policyholders of the Metropolitan Life Insurance Company. In 1911, the death rate from tuberculosis in this group was 224.6 per 100,000. Last year, the rate had gone down to 44.3, which represents a decline of 80 per cent in thirty years. The significance of this amazing achievement lies in the fact that these people represent a good cross-section of the working class population of our country in the cities and towns. The entire nation has shared in these gains and we are altogether a happier and more prosperous country on this account.

Already, in one quarter of our States, the tuberculosis death rate is under 30 per 100,000 population. This means that among 15 millions of our people, tuberculosis is now a minor, if not a negligible cause of death. If we limit our analysis to the white population, the situation is, of course, much more favorable. In eight States, the tuberculosis death rate among white persons is 20 or less

* Delivered at the Annual Meeting of the American College of Chest Physicians, Cleveland, Ohio, June 1, 1941

** Third Vice President and Statistician, Metropolitan Life Insurance Company, New York.

per 100,000, a remarkably low level. In 28 States, considerably more than half of the total, tuberculosis mortality among white persons in 1939 was 35 or less per 100,000. The year 1940 was a good year, and the first five months of this year have shown further improvement. The rate for the country as a whole in 1941 will be under 45.

Those in moderately good economic circumstances are now comparatively free from the ravages of this scourge. I refer to the twenty million people who carry Ordinary insurance in the United States. In the company with which I am associated, the mortality from tuberculosis among these policyholders is under 25 per 100,000. This record is particularly encouraging because Ordinary policyholders have a larger concentration of men than the general population at the ages in which tuberculosis mortality is highest. We in the insurance business really no longer count tuberculosis as a major problem among our Ordinary policyholders.

That is why I am so optimistic with regard to the tuberculosis situation and that is why I look forward with great confidence as to what may be accomplished in the next ten or twenty years.

Yet it would be a grave mistake to underestimate the magnitude of the job yet to be done. In certain large groups of the American people, the disease is still a serious social and medical problem, and a major source of destitution and misery. It would be a betrayal of public trust and responsibility if we were to be lulled to indifference and smugness by our past achievements. There is still a first-rate job ahead of us. And just as Koch and his successors contributed to the campaign against tuberculosis by discovering its cause and modes of transmission, so it shall be our historic task, the privilege of our generation, to set up the necessary machinery for its virtual eradication.

How long it will take to accomplish this task will depend on how vigorously we concentrate our attack on those areas and those groups of people among whom the disease still flourishes. Geographically, tuberculosis is still a major problem in our Southwest. Every State in this area has a mortality rate from tuberculosis well above the average for the country as a whole. This condition characterizes our entire Southern border from the Atlantic to the Pacific, but is at its worst west of the Mississippi River. This condition is certainly not associated with unfavorable meteorological conditions. On the contrary, large numbers of people from all over the country come to these States because their good climate is thought to help recovery. In fact, a large part of the facilities have been built up for the non-residents seeking recovery, while the local problem and the facilities for its care have been largely neglected.

Tuberculosis in the Southwest, as in other parts of the United States, is heavily concentrated among certain race groups—among the Negroes, Mexicans, Indians, and to a lesser extent, among the Oriental peoples. The most important of these minority groups, numerically, are the Negroes, who comprise 10 per cent of the total population of our country. It is the Negro population which today constitutes our chief reservoir of tuberculosis, and it is among them that the bulk of preventive and curative effort must be directed. We shall never succeed in stamping out the disease until we take more seriously the problem of eradicating tuberculosis among these 13 million people. For the country as a whole, the death rate from tuberculosis among them is 3½ times that for whites. In some cities, the mortality from the disease among Negroes is 11 times as high as among their white neighbors. In Milwaukee, for example, the rate for whites is a little over 40, while for the colored, it is about 485 and the situation in several other large cities is not much better. This situation literally cries out for correction.

But if the situation is bad among the Negroes, it is even worse among those of Mexican origin and among the Indians. Tuberculosis rates among these groups reach incredible heights in some places. In San Antonio, the tuberculosis death rate among the 90,000 Mexicans is about 300 per 100,000 or more than double the rate for Negroes and nearly seven times that among non-Mexican whites. The situation is particularly bad in New Mexico because in that State, the evil condition is concealed by the absence of the facts on racial stocks of the tuberculous and, at the same time, there are no provisions for the care of the victims. There is no need to labor the point that the present battle-

front in the campaign against tuberculosis now lies mainly in the areas where these minority groups live.

There are two other important fields in which concentrated effort needs to be made. Certain few occupations, which employ a considerable number of men, are heavy contributors to the annual toll of tuberculosis. Our experience shows that among various groups of workers exposed to silica dust, the tuberculosis mortality rate is from six to more than 10 times the average of those in nonhazardous occupations. The worst sufferers are those engaged in underground metal mining, granite cutters, chippers of metal, tunnel drillers, sand blasters, rock workers in anthracite coal mining, and a few others. Altogether, these and the other occupations with serious extra hazards from tuberculosis, involve a group of not less than half a million men.

We can, therefore, safely say that we know where the residual tuberculosis problem now lies, and what its extent is. Fortunately, the methods for solution of the problem have already been worked out in great detail. We have by now enough experience to know what measures are effective and what facilities are needed to eradicate tuberculosis from our mortality records. I need hardly say that the solution of the problem which lies ahead of us will depend on how quickly we organize ourselves to find the active cases, particularly in those groups and areas where the disease is rife. It will depend upon how seriously we take our duty to give these cases adequate treatment and what we do in the matter of rehabilitating them to an economically useful life after their treatment has been completed. That is the job that lies ahead of us and it will prove no small matter to bring this about.

As the men in the first line of this battle, you know very well that we are not finding the cases in the early stages to the degree that we should. There are not enough tuberculosis clinics in many States and cities, nor are these clinics always manned by skilled people. At this late date, there is no excuse for the brutal fact that only 13 per cent of the patients with pulmonary tuberculosis are admitted to tuberculosis sanatoria and hospitals in the minimal stage. This means training more men to fill the ranks in your fellowship and promoting measures that will bring new men into those areas and into those groups of our population that need them most.

I take it also that you gentlemen are in the forefront of the fight to have more adequate facilities made available for the care of cases. I have just returned from Texas where the National Tuberculosis Association had its annual meeting. I had occasion while there to look into the facilities that were available to Negroes and Mexicans and you can dismiss their facilities as virtually nonexistent. Is it not the responsibility of those who, like yourselves, are dedicated to this field of medicine to bring a situation as desperate as this to the attention of the budgeting authorities of your States and cities? It should not be difficult to prove to these officials and to the people at large that the lack of hospital beds for the care of the tuberculous is very poor economy. The communities which do not provide hospital facilities for the tuberculous pay through the nose. I have on other occasions emphasized the importance of rehabilitation programs for sanatorium graduates. I need not labor the point here because you know better than I how necessary such programs are to make effective the very expensive work of tuberculosis sanatoria and hospitals. You know how foolish it is to provide the care of patients and then to set them adrift only to have them break down soon afterwards and to have them return to hospitals in more advanced stages of the disease than on their previous discharge.

But I do want to say a few words to you along other lines. It seems to me that of all of the medical and health organizations in the country, yours is in the most strategic position to bring about a happy conclusion to our campaign. This is particularly true at this time when because of our defense effort and the activities of the draft we have had put into our hands an extraordinarily useful piece of machinery. I mean the names and addresses of a large body of men who are being rejected for military service because of evidence of tuberculosis. Obviously, many of them are old cases but, on the other hand, many are being discovered for the first time. Through the use of the more exact methods in this draft, it should be possible to find as many as 10,000 young men with pre-

viously undiscovered active lesions. The Army authorities have learned through the bitter experience of the last war, how important it is to exclude these men from the ranks where they would break down and serve as foci of infection to their fellows. These are the people who in the course of the next few years would normally become active cases of the disease in civilian life. What shall we do about them? In some States and cities, a definite program has been developed for the immediate care of these people. The local health departments, in cooperation with the voluntary tuberculosis societies, are taking it upon themselves to follow up these young people and are providing them with the necessary care.

For them, the draft examinations will have proved a blessing in disguise but I confess that the facilities that have been set up along these lines are few and far between. For the country as a whole, I believe we have very largely fallen down in taking advantage of this God-sent opportunity to make a real dent on the residual problem of tuberculosis. It is here that I appeal to you gentlemen to take upon yourselves this responsibility of setting up in your own respective communities, through cooperation with the physicians of the Draft Boards and the induction centers and the local health authorities, the necessary organization for the servicing of these young people. The Surgeon General of the Army, General James C. Magee,* appreciating the importance of this situation, has already given the necessary instructions to make this information available to responsible local authorities who are in a position to follow up these cases and to help them. There is nothing in the way, provided there are in each community some persons who will take it upon themselves to organize this local effort. I can think of nothing more important to do for tuberculosis control at the present time.

Another opportunity, perhaps as large in its proportions, resides in our current developments in defense industries. Large plants are going up; large numbers of men are being employed for the first time. Would this not be a great opportunity to further the tuberculosis movement if in connection with the medical service to industry, an attempt were made to discover early cases through the usual plant medical examination. Obviously, it does not further national defense to permit active cases of tuberculosis to spread their infection among large bodies of workmen and it would be a wise defense measure for industrial physicians, just as it is a wise defense measure for Draft Boards and the Army, to eliminate active cases of tuberculosis from the ranks. In both these situations, your membership is in a strategic position to function.

You have asked me to forecast what the next ten years in the tuberculosis movement will bring about. I am no prophet and I cannot answer this question, much as I should like to do so. I know that there are great opportunities and possibilities in the next ten years. If we take our problem seriously, we can effect as great a saving proportionately in this decade as was brought about in the last one. There is as yet no sign of diminishing returns for effort expended. The forces directed against tuberculosis are increasing all the time; our skills are becoming greater and there is, on the whole, a public support as never before existed. There is no good reason why we should not by 1950 show a death rate from tuberculosis of the order of 25 per 100,000. Instead of more than 25 per cent of the population reacting to tuberculin, only 10 or 15 per cent will. That is my belief and my hope. On the other hand, there are very serious difficulties to overcome. This very period of military preparedness which, on the one hand, offers us a greater opportunity to advance the tuberculosis movement holds out also a source of great danger. We must not repeat the grievous and costly mistake of the last war and take into the Army large numbers of young men with tuberculosis lesions and have them break down under the rigors of Army life. I cannot believe that we will make such a blunder again with all of you gentlemen watching and many of you participating in the procedures. The increased activity of young men on a huge scale in industry may likewise result in the serious breakdown of large numbers of men. In the last war, many young women were also brought under industrial conditions and the experience was not good, as the English records showed. Will that happen here? These are factors which must be taken into

* See appended letter from General Magee which clearly states the attitude of the Surgeon General's office in this connection.

consideration in any forecast of what the next ten years will bring. But through your instrumentality we can throw around such workers the protection which will obviate many of the misfortunes which the record of the last war brought home to us.

I continue to be an optimist in this effort to eradicate tuberculosis. We have done three quarters of the job already that was left us a generation ago—it is in the cards that we shall wipe out the remaining quarter. It will depend on how seriously we take our that we shall wipe out the remaining quarter. It will depend on how seriously we take our task and our responsibilities. There is nothing inherently impossible in our objective. We have the necessary knowledge; we have or can create the necessary skills; we can provide the required facilities, and in doing this we can count on the support of a generally well informed and well-disposed public. Let's go to it, and if you invite me here again in 1950, I hope to be able to say that the chief error in my prediction tonight was the result of my inborn conservatism and moderation.

The paper by Dr. Dublin was submitted to the Surgeon General and his approval requested for the statements in the paper regarding the official attitude on cooperation with civilian tuberculosis agencies. The Surgeon General consented to the publication here of his reply to Dr. Dublin.

War Department
Office of the Surgeon General
Washington

June 17, 1941

Dr. Louis I. Dublin
Metropolitan Life Insurance Company
New York, New York

Dear Doctor Dublin:

I am pleased to acknowledge receipt of your letter of June 5, 1941, transmitting a copy of your recent address to the American College of Chest Physicians for my perusal and comment.

It is particularly gratifying to note the great reduction in tuberculosis rates that has occurred during the last thirty years and the prospect of a further material decline in those rates in the immediate future. While the current military effort will be attended with difficult problems in relation to tuberculosis, these should not assume the magnitude that they assumed during and following the World War. The reduced incidence of the disease among men of military age and the greater stress placed on its elimination before acceptance for service should have a salutary effect on the admission rates while in the service and on compensation costs thereafter. It may be anticipated that the latter, as heretofore, will be magnified by legislative enactments giving a preferred status to veterans who may subsequently develop the disease.

Selectees who are rejected by Army induction boards are reported back to local boards with information as to the causes for such rejection. This information, together with that developed by local medical examiners, is, according to the Selective Service Act, to be regarded as confidential. The act has been interpreted by the Selective Service Administration, however, to permit the reporting of epidemiological data on tuberculosis and other reportable diseases to local health authorities in accordance with the laws of the state concerned. It is difficult from the data available to estimate how effectively this information is being utilized by local health organizations. It appears, however, that it will provide the means for the greatest tuberculosis case-finding effort on record. Besides minimizing the incidence of the disease among military personnel, it will give tuberculosis societies and health organizations throughout the country an opportunity for waging a fight never before possible. It is my opinion that these organizations will generally live up to their obligations in carrying on an increasingly effective campaign against tuberculosis.

Sincerely yours

James C. Magee (signed)
Major General, U. S. Army
The Surgeon General

The Fluoroscope in the Diagnosis Of Pulmonary Tuberculosis*

E. W. HAYES, M.D.
Monrovia, California

In discussing a controversial subject, such as the relative value of x-ray pictures and fluoroscopic study in detecting pulmonary tuberculosis in its early stages, personal opinion unless substantiated by extensive experience under conditions which would ordinarily be encountered, cannot contribute a great deal to the solution of the question discussed. In order to have something more than my own observations and ideas to present at this symposium, I sent out 125 letters of inquiry to physicians throughout the United States and Canada. These are physicians most of whom I know personally, and who have had extensive experience in observing the relative efficiency of the x-ray and the fluoroscope in lung diagnosis. I asked these men for their opinions on the relative value of these two procedures.

In all, there were 109 replies without any follow-up. The large number who took the time and trouble to answer is an indication of the interest in this subject. These replies varied from short letters to lengthy discussions.

As was to be expected, there was a difference of opinions. Opinions differed particularly upon the efficiency with which early tuberculosis could be discovered by means of the fluoroscope. There was general agreement that the use of the fluoroscope is essential as a part of routine lung diagnosis and treatment. There was considerable expression of doubt as to the wisdom of the chest men of the country lending their support to the idea that early lesions of the lungs could be satisfactorily detected by the fluoroscope, except under very special conditions.

The work of Fellows and Ordway of the Metropolitan Life Insurance Company was referred to frequently. Their error in the routine examination of some 20,000 individuals by fluoroscopic study was from 10 to 13 per cent as compared to the results obtained with x-ray pictures. There were a few who felt that this work justified the recommendation of the fluoroscopic study as sufficient for survey work. A number of others felt that this error could be considerably reduced, some citing the results of their own extensive work where the per cent of cases missed was considerably less. McCain of North Carolina and McKay of Cleveland each reported an error of 5 per cent. Placak of Cleveland had an error of from 5 to 7 per cent.

On the other hand, there were many who felt that the error in detecting minimal tuberculosis by the use of the fluoroscope would, under ordinary circumstances, be larger than that reported by the Metropolitan group. Some reported that in their own experience, after a certain number of early cases had been missed by fluoroscopic study and were detected by x-ray pictures taken following the fluoroscopic study, they were still unable to find these lesions by means of the fluoroscope.

It was pointed out that the error in the Metropolitan Life Insurance Company study had to do with all cases of tuberculosis, and that if it had been computed on the basis of early cases alone, the error would, no doubt, have been larger. Attention was also called to the fact that the Metropolitan workers had as near an ideal set-up in the way of equipment, dark room facilities, and as experienced and careful observers as it was possible to obtain. In addition, it was repeatedly mentioned that in their work they used a penetration which carried with it a certain amount of danger to the operator.

In the replies received, it was pointed out very aptly, I believe, that it is not less, but more intensive and intelligent as well as more efficient radiological study, that should be our goal in detecting tuberculosis. If the men doing chest work "let the bars down", so to speak, and go on record as recommending the fluoroscope as an acceptable means of diagnosing early lesions, even if this recommendation has certain definite limitations, the way is opened for all those who are treating

* Presented in symposium on The Role of the Fluoroscope in the Diagnosis of Pulmonary Tuberculosis, before the meeting of the California State Tuberculosis Association, Del Monte, California, April 3, 4 and 5, 1941.

the sick, either regular or irregular practitioners of medicine, to offer opinions on the conditions of the lungs as they see them through the fluoroscope: Opinions that a large number of patients will accept with a feeling of security and which will eventually very often lead to disaster. Not progress but retrogression is liable to result from such a course. Plunkett and others emphasized this danger.

A number of replies called attention to the expense involved in missing early cases by the fluoroscope. They pointed out that the care required for each advanced case which had been missed in the early stage would involve an additional expense that would pay for the x-raying of thousands of patients in a survey.

In answer to the argument that the fluoroscopic study would be used only in surveys where it would be impossible to finance x-ray pictures, attention was called to the fact that that would be in the poorer districts just where the most careful study would be needed, because the living conditions there would tend to produce a high incidence of the disease.

The idea was advanced that, if we go ahead and make surveys using the fluoroscope where x-ray pictures are not available, we can collect statistics, which statistics can be used to make our argument for the necessity of more efficient measures of meeting our tuberculosis problem more convincing. On the other hand, there are many who feel that, inasmuch as a vast amount of statistics regarding the incidence of tuberculosis under different circumstances and different conditions have already been collected, what we need now is not necessarily the collection of more statistics, but the presentation of the facts to those who control the funds, which we already have with sufficient force to obtain the equipment which is necessary, not only for the satisfactory detection of tuberculosis under ordinary conditions, but also for the efficient care of those with the disease after they have been discovered. It was pointed out that vast amounts of money are constantly being spent for projects in this country which are not nearly so vital to our general welfare as is the control of tuberculosis, simply because those behind these projects are better politicians than are those endeavoring to control tuberculosis.

The campaign against tuberculosis has been carried on for only a little more than a generation. Everything considered, progress so far has been at least encouraging. Should we make any radical change in our methods of procedure until we at least have assurance that we are changing to something that will more definitely answer our purpose, both as to efficiency and cheapness?

There were a few who expressed the opinion in their replies that fluoroscopic study was equal to or perhaps better than x-ray pictures of the lungs in the detection of early tuberculosis. These are workers who have at their disposal, among other things, the best of equipment and who work under conditions which are as nearly ideal as can be obtained, but even men like Stiehm, who works with the students at the University of Wisconsin and is one of the outstanding champions of the efficiency of fluoroscopic study for detecting early tuberculosis, follows the fluoroscopic study with an x-ray picture. Stiehm feels he needs the x-ray picture as a permanent record.

In the practice of medicine, as elsewhere, it is the enthusiast who has developed more or less special ability along certain lines and who has some genius who makes for progress. On the other hand, it is the conservative, or more truly, the moderately conservative, who directs that progress into avenues of practical efficiency.

In classifying the opinions expressed in the replies, I have grouped them under three or four different headings. At times, it was difficult to decide under which of these headings particular opinions should be grouped. Inasmuch as the use of the fluoroscope is on the defensive in this discussion, where there has been any doubt in my mind as to how to classify any particular opinion, in endeavoring to be fair in the classification, I have placed it with that group which tends to favor the use of the fluoroscope.

The opinions were classified as follows:

(1) Eight felt that the fluoroscopic study is as efficient or almost as efficient as x-ray pictures of the chest in routine examination of groups of patients in an effort to detect early tuberculosis.

(2) Forty-four were w i l l i n g to accept fluoroscopic study of the chest instead of x-ray pictures in an attempt to find tubercu-

losis in groups of patients as a compromise, this compromise made because of the difference in the expense of the two procedures, and provided x-ray pictures be taken of all cases where the fluoroscope reveals any suspected deviation from the normal.

(3) Fifty-two felt that, in general, fluoroscopic study is not an acceptable means of examining chests for the presence of early tuberculosis.

(4) Five, through lack of experience or for other reasons, did not wish to express their opinions definitely either way.

Many of those who were willing to lend their support to the use of the fluoroscope in survey work expressed the opinion that the equipment should be of the modern type with the latest screen. Some stressed the importance of the flexibility of the tube as well as of the screen and diaphragm. At the same time, they felt that the operator should be an expert in the operation of the fluoroscope and in the interpretation of the fluoroscopic image. To be an expert, he must have years of experience, be continually using the fluoroscope, must possess a certain acuity of vision, and must be familiar with the structure of the normal lung. Attention was repeatedly called to the difficulty of securing proper dark room facilities in connection with portable fluoroscopic equipment.

It was also repeatedly mentioned that sufficient time must be spent in the dark room to allow for proper accommodation of the eyes. Fellows, Ornstein, and others feel that twenty minutes is necessary. Some suggest from five to ten minutes. The handicap of optical fatigue, both in fluoroscopic work and in the study of smaller films, was mentioned by many. It is believed that after a period of about two hours' work, the eyes become too tired to accurately see small lesions on the fluoroscope or on the small films.

The time required in the use of the fluoroscope was referred to repeatedly. A number, speaking from their own experience, felt that ordinarily it took from two to five minutes to fluoroscope each patient where group work was being done. The majority, however, that it took nearer five minutes rather than two minutes. The dangers to the operator, in spite of all protective apparatus, through exposure to escaping rays were referred to by a number of men.

Several classifications of the advantages as well as the disadvantages of the fluoroscope were submitted. The following is a composite of these classifications:

Advantages of the Fluoroscope

(1) Fluoroscopic equipment is less expensive than the equipment for taking x-ray pictures of the chest.

(2) A fluoroscopic study of each patient can be made at much less expense than would be incurred in taking x-ray pictures.

(3) A fluoroscope is at times, at least, more accessible and more easily, quickly, and readily used by the doctor.

(4) The fluoroscope gives information about movements of heart and diaphragm and relative ventilation of the two lungs during different phases of respiration. It also reveals pulsation of mediastinal masses as well as the presence of small pneumothoraces and hydrothoraces which would not be apparent on an x-ray picture.

(5) Through use of the fluoroscope rather than by means of x-ray pictures, it is more frequently possible to detect areas in the mediastinum, especially in children. Also, by rotating the chest and moving the shoulders and studying each lung from top to bottom, it is possible by the fluoroscope to detect small areas in the lung fields that might be obscured by bone on the pictures. Abnormal areas in the costophrenic gutter, particularly in the posterior gutter, as well as in front of and behind the heart, may be found more frequently on the fluoroscopic image. By the fluoroscopic study, it is also possible to obtain more definite determination of the presence or absence of cavities and to determine the position of cavities and areas of infiltration in relation to the chest wall than it is by x-ray pictures. Finally, the fluoroscope may clear up certain shadows on the x-ray which are caused by the nipple or the breast itself, or by muscles or other structures.

Disadvantages of the Fluoroscope

(1) The fluoroscope may be used by individuals who, through lack of training and experience or for other reasons, are not in a position to interpret the fluoroscopic picture.

(2) The operator, through impatience or lack of time or lack of understanding, may not wait long enough for his eyes to become

accommodated to the dark before making the examination.

(3) Excessive fat or otherwise thick chest walls may interfere with the fluoroscopic image of the lungs.

(4) The fluoroscopic image is fleeting, and its interpretation, which is recorded in notes only, is just one man's opinion and judgment, which may be influenced by many factors. In other words, it leaves no permanent record which may be studied impartially by others. The x-ray is a definite fact recorded, which, in questions of doubt, may be studied by more than one person. From a medico-legal standpoint, a permanent, recorded picture of the lungs is important, particularly in industry, as industry is interested in this record, not only for the protection of the company, but also for the protection of the individual.

(5) Under ordinary circumstances, the per cent of early cases missed is too high to be satisfactory in the opinion of many, and the general use of the fluoroscope would result in the missing of so many cases of early tuberculosis that it would tend to retrogression rather than progression.

While not entirely pertinent to this symposium, the opinion expressed by all of those who discussed the fluoroscope from this angle was that it is much more efficient than physical examination in the detection of pulmonary pathology.

Many, in replying, gave in order their idea of the relative value of roentgenological methods of studying the lungs. Following is a composite of these opinions.

(1) Stereoscopic, 14x17, 11x14, or 10x12, celluloid films.

(2) Single, large celluloid films taken anterior-posteriorly or posterior-anteriorly, as well as in other positions where the conditions warrant.

(3) Paper films.

(4) 4x5 celluloid films.

(5) Fluoroscopy.

(6) 35 mm. celluloid films.

The greatest difference of opinion was on the relative position in this classification of the 4x5 celluloid films and paper films. Some workers who have had rather extensive experience in checking paper films with large celluloid films, both flat and stereoscopic, stated that not a single case would have been missed with the paper films alone. On the other hand, it was also stated that, if stereoscopy of the 4x5 films is developed along with a satisfactory method of magnification so as to facilitate interpretation, because of the cheapness of these films, their use will perhaps be the method of choice in all survey work.

However, Douglas of Detroit, where the 4x5 films have been used extensively, reported an error in these films as they are made at the present time of 2.6 per cent as compared with the large celluloid films. He and his co-workers feel that this error could be reduced now owing to a better understanding of the small films. Plunkett reported an error of less than 2 per cent between the 4x5 and the large celluloid films.

Bridges of Rochester, New York, reported an error of only .7 per cent when all the cases were considered, and 1.5 per cent when only the minimal cases were considered. These small films cost only about one-tenth of what the 14x17 celluloid films cost, but at present they are made by equipment which is attachable only to the large x-rays which are expensive and not portable. Until the equipment for taking the smaller films is less expensive and more easily transportable, they will not be practicable for survey work in general.

In the opinions expressed in the replies, the possibilities which may be inherent in the 35 mm. films are not as yet understood, but it is possible that eventually the use of these, too, may be an efficient means of carrying out survey work.

Some who replied to the inquiry, and among those most emphatic in their opinions were Pinner of New York City and Cocke of Asheville, felt that an intelligent examination of the chest cannot be made without the use of both the fluoroscope and the x-ray.

Finally, it must be kept in mind that there are many different factors that enter into the cost of a radiological study of the lungs in tuberculosis survey work. These factors include: the time of the physicians and nurses required to carry out any special procedure; the original cost of any particular type of roentgenological equipment together with its upkeep, replacement of parts and housing facilities; the time required of assistants in compiling and filing records of the work done; the traveling expenses, not only of the people

who carry on the roentgenological work, but also of the patients themselves; and, finally, the efficiency of any particular radiological procedure in detecting pulmonary tuberculosis. Many men doing chest work perhaps have not given the cost of these different factors a great deal of thought. There is not available, to my knowledge, a cost formula which will give us a definite idea of the expense involved in these different phases of the work. If there were such a formula, it might reveal that the cost of the film itself in taking x-ray pictures is relatively little, not more than a very small per cent of the cost of the whole procedure. Until such a formula is available, it will be difficult to draw definite conclusions as to the relative cost of the different radiological methods.

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Principles of the Pneumoperitoneum Treatment Of Pulmonary Tuberculosis*

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Ten years have elapsed since we originated and introduced artificial pneumoperitoneum for the treatment of pulmonary tuberculosis. On the basis of pertinent reports of other clinicians and of the experience we have gained during this period, it is justifiable to summarize the fundamental principles of this method of treatment.

Physiological Considerations

In the treatment of pulmonary tuberculosis, the primary aim of all collapse measures is the production of a therapeutically useful relaxation of the diseased lung. With pneumoperitoneum treatment, this is accomplished by increasing the intraperitoneal pressure and thereby elevating the diaphragm. Under normal conditions the intraperitoneal pressure, that is, the pressure between the visceral and parietal peritoneum, varies in different sections of the abdominal cavity. It is atmospheric (neutral) in the mesogastric and hypogastric regions, and negative in the subdiaphragmatic areas. These facts have important practical implications, namely, when the initial treatment is given below the umbilicus and the needle is introduced, no visible oscillations are registered on the manometer. Consequently, the operator cannot rely on the manometer as an indicator as in pneumothorax treatment. He must get his orientation about the position of the needle by his sense of touch. One can feel the resistance offered by the different layers of the abdominal wall, and the lack of resistance when the needle enters the abdominal cavity. We have encountered only few instances in which 0.5-1 cm. positive pressure was noted at the first inflation. Infrequently we have seen slight negative pressure in this area, and interpreted it as a sign of transmission of the subdiaphragmatic negative pressure. The subdiaphragmatic intraperitoneal pressure is subatmospheric, but it is less negative than the intrapleural pressure. This is understandable if one considers that an increase in the capacity of the lower chest during inspiration cannot but increase the negative pressure in the subdiaphragmatic space; during expiration a converse change is produced. Treatments by the subdiaphragmatic route (near the lower border of the thorax and below the reflection of the pleura) have certain advantages over injections below the umbilicus:

(1) The similarity of the technique to that of artificial pneumothorax.

(2) The availability of the manometer as an indicator.

(3) The indication of a properly performed inflation by the early change of the liver dulness into an area with tympanitic percussion.

(4) The separation of the liver from the dome of the diaphragm is always gradual, thus the disagreeable feeling occasionally reported by patients whose initial treatment is given by the subumbilical route, is avoided.

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By consecutive weekly or two-weekly injections of measured amounts of air, one is able to produce sufficient increase in the intraperitoneal pressure that, in turn, leads to a therapeutically useful relaxation of the tuberculous lung. In cases in which 500 cc. of air is injected at weekly intervals the intraperitoneal pressure is slowly rising during the first few weeks, a plateau of approximately 9 cm. positive pressure is reached in about ten weeks. The pressure remains at this level, with minor changes, during the subsequent course of the treatment. When 1000 cc. of air is given at weekly intervals, the level of 11 cm. of positive pressure is reached in about eight weeks. This level can be maintained by continued weekly injections of the same amount of air.

One has to recognize, however, that besides the amount of the injected air, there are other factors that influence the intraperitoneal pressure. The most important of these is the tonicity and integrity of the diaphragm. Its tonicity decreases in sympatheticotonics and increases in vagotonics. In long standing pulmonary tuberculosis, the diaphragm loses its normal tonicity. Under favorable circumstances, a substantial rise of the diaphragm can be attained by pneumoperitoneum. We have seen a consequent reduction of the apico-basal diameter of the lung by as much as 32 per cent. It is important to keep in mind that extensive adhesions prevent the rise of the diaphragm. Therefore, it is futile to expect beneficial results from pneumoperitoneum treatment if fluoroscopic examination or double exposure film (inspiration superimposed on expiration) reveal that the diaphragmatic motions are absent because of adhesions. Every case selected for this treatment should be surveyed with this particular point in mind.

The tonicity of the abdominal wall influences the intraperitoneal pressure changes during treatment. The irritability of the tuberculous intestines, often seen in patients receiving this treatment, may induce various grades of reflex contraction of the abdominal muscles in response to the injection of air. On the other hand, a reflex relaxation of the abdominal wall may be associated with an increase in the intra-abdominal pressure, in the absence of tuberculous involvement of the intestines or the peritoneum. In a great many patients with long standing pulmonary tuberculosis, one finds a weakening and relaxation of the muscles of the anterior abdominal wall. In these cases a properly designed and well-fitted abdominal support can be used for the prevention of undue distention of the abdomen, and for aiding the upward displacement of the diaphragm.

Another factor of significance with regards to establishing adequate intraperitoneal pressure is the type of breathing. With distinctly thoracic breathing the intra-abdominal pressure tends to fall during inspiration. In such instances there is a greater tendency toward collection of air in the subdiaphragmatic regions during pneumoperitoneum treatment than in the combined thoracico-abdominal, or in the abdominal type of breathing. This, in turn, means a greater upward force exerted upon the diaphragm.

To maintain the maximum elevation of the diaphragm it is well to keep bed-patients in the semirecumbent position, thus maneuvering the air to underneath the diaphragm. A simple backrest made of mattress material can be used for this purpose. In the supine position some of the air collects in the mesogastric area and distends the anterior abdominal wall. One can exert increased lifting effect upon one side of the diaphragm by having the patient lie on his side. In this position—whether the patient had a phrenic nerve block or not—the free intraperitoneal air is forced to the uppermost dome of the diaphragm.

Selection of Cases

Pneumoperitoneum can be used with advantage in fibrocaseous, caseous, and ulcerative forms of tuberculosis. Thin-walled cavities are collapsible by pneumoperitoneum regardless of their location, provided adhesions to the chest wall do not obviate their closure by pulmonary relaxation. The best prospects are cases where the lesion is a basal one, or it is localized in the lower one-half of the lung. (It is notorious how difficult it is to close basal cavities by thoracoplasty.) However, we have seen clearing of upper lobe lesions and the closure of upper lobe cavities.

Pneumoperitoneum can be used in adults as well as in children. Patients over fifty years of age who do not adapt themselves readily to bilateral pneumothorax tolerate

pneumoperitoneum well, provided no coronary disease, marked arteriosclerosis or cardiac decompensation, are present. Artificial pneumoperitoneum is a good procedure for establishing pulmonary relaxation in tuberculous women following childbirth. When labor is completed, there is a sudden decrease in the high intraperitoneal pressure that was present during the second half of pregnancy. With the disappearance of the lifting effect of the enlarged uterus the diaphragm descends from its high position to its normal level. The diseased lung that was kept in a state of relaxation by the elevated diaphragm expands again. Consequently cavities may reopen, tubercle bacilli may be liberated and diseased areas of the lung subjected to respiratory stress and strain. Pneumoperitoneum induced directly after delivery elevates both domes of the diaphragm to their previous high level.

Clinical and experimental research of others proved that dyspnea can be relieved in patients suffering from emphysema by applying an especially constructed support to the abdomen. The effect of this abdominal support was explained by the increased intra-abdominal pressure and by the consequent rise of the diaphragm. By forcing the diaphragm from its pathologically low position to the expiratory position, its contraction and respiratory function were improved and an average increase in the vital capacity of 39 per cent was attained. Our experience with pneumoperitoneum in cases of pulmonary tuberculosis complicated by basal emphysema or asthma, showed that similar results can be accomplished by this treatment.

Because of the improved diaphragmatic function, patients whose tuberculosis is complicated by bronchiectasis may derive benefits from pneumoperitoneum treatment. It has been noted in many instances that following the institution of pneumoperitoneum there is an increase in expectoration without an increase in cough. Large amounts of sputum are eliminated with slight effort. Subsequent to the easy evacuation of the bronchial tract long periods of pulmonary rest ensue. The general favorable effect of adequate elimination of inflammatory products from the lung—without strenuous coughing—and the increased rest to the diseased pulmonary tissue are self-evident.

Also, pneumoperitoneum is the treatment of choice in bilateral pulmonary tuberculosis when the process is so extensive that any other form of collapse therapy appears to be too hazardous. We have found some of our most gratifying results in such cases, not so much by attaining permanent cure as by improving the general and pulmonary condition of the patient and thereby preparing him either for unilateral pneumothorax or for thoracoplasty. It is particularly valuable for preparing patients with co-existent basal and apical cavities for upper thoracoplasty by closing the basal cavity. Furthermore, pneumoperitoneum can be resorted to in cases in which pneumothorax had been discontinued and cannot be re-established at the time of a new flare-up of the disease.

As a supplementary treatment, pneumoperitoneum is used:

(1) In addition to phrenic nerve block when within a reasonable length of time the therapeutic effect of the phrenic nerve paralysis is unsatisfactory either because of insufficient rise of the diaphragm; or because despite a good rise of the paralyzed diaphragm, cavities are not obliterated, or the sputum remains persistently positive. If during the extended course of pneumoperitoneum treatment the motion of the paralyzed diaphragm occurs, the phrenic nerve block is repeated as many times as the circumstances may require.

(2) Pneumoperitoneum is given as an auxiliary measure in cases of artificial pneumothorax where adhesions prevent the separation of the diseased lower lobe from the chest wall.

(3) In the presence of a unilateral pneumothorax complicated by a basal lesion on the opposite side.

(4) In addition to the thoracoplasty or paraffin pack, when lesions in the distal portions of the lung remain active.

Pneumoperitoneum is administered as a matter of expediency in cases where pneumothorax, unilateral and bilateral, is indicated but cannot be given because of pleural adhesions. In unilateral disease the combination of phrenic nerve block and pneumoperitoneum is used. The nerve block should precede the pneumoperitoneum, and only after the patient has adapted himself to the nerve block should injections of air be started. In bilateral disease no pneumoperitoneum is given if the

vital capacity of the lung is less than one-third of normal, or in the presence of marked general debility.

Considering the high frequency of intestinal tuberculosis in patients with far advanced pulmonary tuberculosis, and the beneficial symptomatic and curative results by pneumoperitoneum in tuberculous enterocolitis, there is a possibility of influencing favorably both of these conditions by sustained pneumoperitoneum treatment. The number of patients in whom peritoneal adhesions resulting from a foregone tuberculous peritonitis preventing pneumoperitoneum treatment, is rather low.

Discussion

During the course of pneumoperitoneum treatment fluoroscopic check-ups are indispensable. A properly induced pneumoperitoneum is characterized by the collection of air in the subdiaphragmatic region in the upright position. Also fluoroscopy is essential for ascertaining whether or not the desired elevation of the diaphragm has been accomplished. Each inflation is preceded by a fluoroscopic examination. This also gives information as to the response of the tuberculous process to the treatment, and further, as to the presence or absence of peritoneal effusion or adhesions secondary to repeated intraperitoneal injections of air. The development of effusion may be asymptomatic or it may be signalized or accompanied by vague, diffuse abdominal pain, gastrointestinal disturbances, such as loss of appetite, abdominal discomfort after meals, diarrhea, and by malaise and fever. Small effusions are difficult to detect because of their collection in the pelvic area. Placing the patient in the knee-hand position and percussing the periumbilical region are helpful in finding small effusions that are not visible on the film or on the fluoroscopic screen. Small effusions do not interfere with the treatment, therefore their removal is not necessary. Slender, band-like adhesions are often seen but as long as they remain localized and limited in number, they do not influence the course of the treatment. The development of extensive adhesions renders impossible the continuance of intraperitoneal injections.

Other complications are less frequent, but knowing of the possibility of their recurrence as well as their recognition and adequate treatment are important. These are: (1) Air embolism; (2) Subcutaneous emphysema; (3) Accidental pneumothorax, mainly when the subdiaphragmatic route is used; (4) Pneumomediastinum; (5) Enlargement of inguinal or umbilical hernias; (6) Diastasis of the abdominal rectus muscles; (7) Intra-abdominal pneumocele. Nausea, vomiting, and peritoneal shock occur only rarely, when large amounts of air (over 1000 cc.) are given too fast at the time of the first treatment. The danger of causing intra-abdominal hemorrhage or perforation of the intestine is nil if the needle is introduced slowly through the abdominal wall.

The duration of treatment must be adapted to the individual requirements of each case. Regardless of whether pneumoperitoneum is used as an independent procedure or as an adjunct to other forms of collapse therapy, the treatment should be continued until the disease can be classified as apparently arrested or until sufficient improvement is accomplished in the patient's pulmonary condition so that he becomes eligible for some other type of conservative or surgical treatment; unless tuberculous or nontuberculous complications, or untoward changes in the patient's general or pulmonary condition necessitate its discontinuance.

Conclusions

(1) Pneumoperitoneum is advocated as an added form of collapse measure for the treatment of pulmonary tuberculosis in selected cases. It is a flexible and reversible procedure like pneumothorax. It can be used in institutionalized patients as well as in ambulatory patients.

(2) The effectiveness of pneumoperitoneum is derived from the increased intraperitoneal pressure that, in turn, leads to the limitation of the respiratory excursions of the lung to a certain extent, to a shortening of its apico-basal diameter, and to a decrease in the lung volume, provided adhesions do not prevent the upward displacement of the diaphragm.

(3) As a preliminary measure, pneumoperitoneum is of value in preparing the patient for major surgery.

(4) Observations show that sustained pneumoperitoneum treatment—either as an independent measure or as an adjunct to

other forms of collapse therapy—is capable of establishing a satisfactory relaxation of the diseased lung that in suitable cases is conducive to changes favorable to the clearing of tuberculous infiltrations, and to the reduction in the size or to the closure of tuberculous cavities.

Muirdale Sanatorium.

Anesthetic Methods Compatible With the Use of Cautery in Thoracic Surgery: A Preliminary Report*

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Cyclopropane seems to be a very satisfactory anesthetic agent for thoracic procedures. It produces a smooth, easily controlled narcosis. The gas is well tolerated and its administration should always ensure an adequate oxygen supply. Postanesthetic recovery is rapid; although nausea may be troublesome for a time in the immediate postoperative period.

We employed cyclopropane in a majority of thoracic procedures until it became necessary to supplant it with fireproof agents. This was occasioned by the use of electrocoagulation for the control of bleeding, in extrapleural pneumothorax and the extrapleural pack as performed at the University Hospital. I feel that flammable anesthetic agents administered with oxygen in a closed system are absolutely contraindicated in the presence of high frequency currents.

One fireproof method is the administration of nitrous-oxide-oxygen. This mixture may be satisfactory when adequate preliminary medication is employed. However, nitrous oxide is a weak anesthetic agent and sthenic patients may prove difficult to control. Insufficient oxygenation is likely to result from crowding nitrous oxide in the endeavor to produce smooth anesthesia. On the other hand, excessive premedication may result in untoward postoperative depression.

Another method, and one of considerable promise, is the intravenous administration of pentothal sodium accompanied by oxygen inhalation from a gas machine. This method has proved satisfactory in several instances although the need for a second anesthetist for the oxygen administration may limit the use.

I would like to emphasize my belief that intravenous anesthesia with pentothal sodium is more safely accomplished if oxygen is administered throughout the procedure from a gas machine. The anesthetic is smoother, the anesthetist can tell a great deal about the condition of the patient by watching the breathing bag, and artificial respiration may be instituted at any time by rhythmic pressure on the bag. Troublesome slight obstruction to respiration may be overcome by moderate pressure during inhalation. The patient's color seems to remain more satisfactory when oxygen is used with pentothal sodium.

A third method, and one that has proved most useful in our hands, consists of moderate premedication, a basal dose of tribromethanol, infiltration of the operative area with novocain, and the use of nitrous oxide as a supplementary agent whenever necessary. Oxygen is always administered throughout the operative procedure.

Dunlop[1] sent questionnaires to several thoracic surgeons and anesthetists asking about their choice of anesthetic agents and methods. The replies showed a considerable variance in opinion and procedure. Only 20 per cent of those replying indicated the choice of tribromethanol in some or all of their thoracic operations.

The thoracic operation most frequently performed which requires a general anesthetic at the University Tuberculosis Hospital, has

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been the extrapleural pack procedure in the treatment of pulmonary tuberculosis[2]. Most candidates for this operation have been young or middle aged adults and most of them have been well developed and apparently robust, rather than the asthenic type.

Our procedure for the good risk extrapleural pack case has been as follows:

Special inquiry is made during the preoperative examination to rule out the presence of colitis or any lesion of the lower bowel which would preclude the use of colonic anesthesia.

A cleansing enema is ordered for the night before operation.

Nembutal (pentobarbital sodium), grs. 1½ to 3, is administered to ensure restful sleep. Fluids are limited after midnight. Nembutal, grs. 1½, is repeated several hours prior to operation to allay fear and apprehension. Pantopon, grs. 1/4 to 1/3, is administered one hour prior to the avertin enema. Neither atropine nor scopalamine are employed as it is believed that they increase the danger of atalectasis by making the secretions more viscid and tenacious in the tracheobronchial tree.

The dose of tribromethanol has been limited to 70 mgs. per kilo of body weight and is administered forty-five minutes before the scheduled time for operation.

The patient may be only very drowsy upon arrival in the surgery or basal anesthesia may be complete. A Guedel pharyngeal airway is placed before the mask is adjusted, if it is tolerated. If not, it is placed after anesthesia has been deepened with nitrous oxide. Frequently weak mixtures of nitrous-oxide-oxygen suffice, and it has not been necessary to force nitrous oxide at the expense of an adequate metabolic supply of oxygen. Supplementary anesthesia is generally required during the infiltration of the area of incision with novocain and during the early stages of the operation—incision, exposure of the ribs, and costectomy. Although the percentage of nitrous oxide is lessened during the later stages, the administration of oxygen is continued throughout. In a few cases nitrous oxide has not been required.

Respiration is quiet with this anesthetic procedure, and we have had very little trouble with respiratory obstruction. There is little or no shock associated with the extrapleural pack operation.

Upon return to the ward, patients are routinely placed in an oxygen tent and a blood transfusion is administered. Sedation may be required in the immediate postoperative period and in our experience there has been an early return of the cough reflex—usually within the first hour following operation.

Patients with long standing suppurative conditions who are to undergo radical surgical procedures, are notably poor anesthetic risks. This group, comprising such cases as empyema, lung abscess, and the extensive saccular type of bronchiectasis, usually have excessive tracheobronchial secretions. These patients are toxic and they may have extensive kidney damage and cardiovacsular disease.

I believe that cyclopropane is the safest and most satisfactory anesthetic agent for this poor risk group, but if the use of cautery is necessary, tribromethanol may be employed if a conservative dose (60 to 70 mgm. per kilo) is not exceeded. The local infiltration of the area of incision with novocain should be more extensive, or it might better be replaced by a regional block.

"Wet cases", especially those in which there is danger of contamination of the sound lung with purulent material, are placed in a moderate Trendelenburg position, and the upper respiratory tract is cleared by intrapharyngeal and intratracheal suction whenever indicated during the operation.

The immediate postoperative care is most important in the successful outcome of these cases. I believe that the anesthetist should stand by and be ready to aspirate accumulations of fluid in the upper respiratory tract and to administer oxygen from a gas machine if the need arises. The use of avertin in thoracic surgery has been frequently blamed for untoward and prolonged postoperative depression. I believe that the use of a conservative dose and adequate attention in the immediate postoperative period might eliminate the cause of this criticism to a great extent.

Intratracheal suction is accomplished with a No. 12 or No. 14 French urethral catherter passed by the nasal route. It will usually enter the glottis without difficulty. The suction procedure is facilitated by the basal dose of avertin, as removing the mask does not re-

sult in as much lightening of anesthesia as would be the case if gas alone were employed. The use of avertin is likewise helpful in cases of bronchial fistula as they are difficult to anesthetize because of the escape of gas.

In regard to the use of intratracheal anesthesia, we have not found it necessary when avertin nitrous oxide was employed. It is felt that it may be better to avoid the deep anesthesia necessary for the easy introduction of a Magill tube. Intubation under light anesthesia may cause trauma, and the coughing and struggling may cause excessive secretions or even contamination of the sound lung with purulent material. Adequate positive pressure may be obtained by increasing the pressure within the breathing bag, provided the face mask fits tightly. Modern gas machines have an automatic escape valve adjustable to any desired pressure.

Comment

In our search for a suitable anesthetic procedure for thoracic surgery which requires the use of electro-cautery, the use of a basal dose of tribromethanol, supplemented by local infiltration, and the use of nitrous oxide has so far proved to be the most satisfactory in our hands. I believe that the use of oxygen throughout the procedure is very important and that nitrous oxide should never be crowded at the expense of an adequate metabolic supply of oxygen.

This method has come under considerable criticism. Beecher[3] believes that the method should be condemned, but I believe that our results to date warrant a further trial of the method.

University of Oregon Medical School

References

1 Dunlop, J. G.: "Anesthetic Practices in Thoracic Surgery," *Anesthesia and Analgesia*, 18: 301-311 (Nov.-Dec.) 1939.

2 Matson, Ralph C.: "The Treatment of Pulmonary Tuberculosis," *J.A.M.A.*, 115: 1620-1625 (Nov. 9) 1940.

3 Beecher, Henry K.: "Some Controversial Matters of Anesthesia for Thoracic Surgery," *Jr. of Thoracic Surg.*, 10: 202-219 (Dec.) 1940.

Importance of Early Diagnosis In Tuberculosis

A. LOUIS GRAMSCH, M.D.
Ridgewood, New Jersey

Although ranked as the leading cause of death in this country's mortality tables thirty years ago, tuberculosis has in our age been relegated to seventh place. This is not due to the fact that any new panacea has been discovered, but that a systematic campaign for early diagnosis and hospitalization is now the regular procedure in most well-regulated communities. True, many advances have been made in the treatment of the disease, particularly in recent years, and especially in the matter of chest surgery.

We have come a long way from the simple axioms previously advanced of fresh air, nourishing food, rest and sunshine. However, it might be immediately added that these simple rules have not been supplanted, but rather have been augmented by more active methods of both medical and surgical treatment. The decline and death rate from tuberculosis is a striking example of what can be accomplished if a well organized, widespread effort is directed to eradicate the disease. It is evident that prevention must go hand in hand with cure, and it has been toward prevention and education, as well as cure, that efforts of more recent years have been directed.

In every state in the country, tuberculosis of the lungs is classified, according to law, as a communicable disease. This means that it may be communicated from one person to another, and is, therefore, a disease dangerous to public health.

Although the public accepts as right and proper the regulations concerning the isolation of those sick with such diseases as scarlet fever, diphtheria and smallpox, it does not regard tuberculosis in the same light.

In the minimal stage, a patient often has absolutely no symptoms which would make people suspect that he has tuberculosis. He may run no temperature at all, and may have

no cough; his weight may remain stationary. It is only upon being x-rayed that the condition becomes evident. Early discovery means early recovery. Early tuberculosis, although difficult to diagnose, is easy to cure, while advanced tuberculosis is easy to diagnose but difficult to cure.

Children are born into the world without being infected with tuberculosis, but somewhere along the line, during their lives, many contract the disease. The purpose of the tuberculin testing and x-raying is to prevent this infection with tuberculosis among a multitude of young people, some of whom develop the active disease and from which many die.

Tuberculin testing and x-raying has awakened an interest in tuberculosis, its prevention, care and cure and an interest in the hospitals admitting these cases. These surveys have also resulted in a better understanding on the part of the public, of the problem of tuberculosis.

Out of approximately six thousand students tuberculin tested in Bergen County, we have found 18 children (including observation cases) with minimal, moderately and far advanced lesions so far and most of these children are now in the hospital. In our school surveys where an x-ray, taken after a positive tuberculin reaction is reported negative, the family physician is advised to have a check-up of the student within a certain period of time. These check-ups for positive reactors are very important, and if we can establish them as routine for our students, in their formative years, they are the more likely to consult their doctors regularly during adult life.

I feel one can see the importance of compulsory tuberculin testing and x-raying of all positive reactors of high school children and the personnel of the school, as well as the immediate family of positive reactors. This, in my estimation, is the best and quickest way to further lower the tuberculosis incidence in the country.

School surveys may not yield a large number of cases of tuberculosis. Nevertheless, the discovery of any case in its earliest form is of immeasurable value. It is not only important for the individual concerned, but also to those associated either directly or indirectly with such a person. This, of course, brings to the attention of the family the necessity of considering their own health as well as that of the child since it is not too uncommon to find a familial source of infection responsible for this manifestation in the child.

It is not hoped to control tuberculosis through examination of high school students, but the educational value to these students, their parents, and the public in general are important reasons for the survey.

The cost of tuberculosis is four-fold:

(1) Cost in lives.
(2) Cost in disability.
(3) Cost in happiness.
(4) Cost in money.

What makes tuberculosis an especially costly disease is because the period at which it is most likely to break out, is during the period of man's greatest usefulness, that is, from his twentieth to his thirty-fifth years. Tuberculosis remains, without question, one of the most expensive ills which beset mankind.

No one can foretell what the future history of our fight against tuberculosis will be. Some believe that a drug or panacea of some kind will be discovered; others are looking for some antitoxin, serum or vaccine; while still others are of the opinion that gradually the human race will become immune to tuberculosis so that while the disease itself will still be with us, the harm it does will amount to little. There must be no letting up in our efforts, but there must be continued unremitting study, investigation and education, if we ever expect to control tuberculosis.

The greatest need, and a very vital factor, is the education and understanding of those directly or remotely concerned with the problem. This, of necessity, includes every member in any given community since, in its broadest aspect, tuberculosis is a public health problem. The disease not only requires early discovery and recognition for treatment, but even more essential is the need for protecting those who have been exposed to it and avoiding the likelihood of infection.

A growing appreciation on the part of the general practitioner of the importance of finding tuberculosis in its early stages and the prompt segregation of all those infected, has done much to bring about the decline in mortality figures.

When the majority of people understand

the problems of tuberculosis, there is no question what the verdict will be. We will continue to prevent its spread year after year and lengthen the span of life for ourselves as well as the coming generations.

Bergen County Hospital.

Organization News

Missouri Chapter Entertains

The Missouri Chapter of the College was the host for a cocktail party given in honor of Dr. Paul H. Ringer, Asheville, North Carolina, at the Jefferson Hotel, St. Louis, Wednesday, November 12th. Dr. Ringer, Regent of the College for District No. 4, is the retiring President of the Southern Medical Association, which held their annual meeting at St. Louis, November 10-13. Arrangements for the party were in charge of Dr. Paul Murphy, secretary-treasurer of the Missouri Chapter, and a pleasant evening was enjoyed by those who attended. Among the guests were: Dr. Walter E. Vest, former Governor of the College for West Virginia; Dr. H. I. Spector, Regent of the College for District No. 7; Dr. Herbert L. Mantz, President of the Missouri Chapter; Dr. Elmer E. Glenn, Vice President of the Chapter; Dr. Darrell H. Trumpe, Secretary-Treasurer, Illinois Chapter; and Murray Kornfeld, Chicago, Executive Secretary of the American College of Chest Physicians.

Pennsylvania Chapter Meets

The Pennsylvania Chapter of the American College of Chest Physicians held its first annual meeting at the State Tuberculosis Sanatorium, Cresson, Pennsylvania.

A business meeting was held in the afternoon. This was followed by a very interesting and instructive scientific session which lasted until 6:00 P. M. Dr. Chevalier L. Jackson spoke on "Obstructive Atelectasis." Dr. Thomas Stites (by invitation) spoke in detail with regards to "Pneumoperitoneum in the Treatment of Pulmonary Tuberculosis." Dr. Ross K. Childerhose read a very interesting paper on "Silicosis and Tuberculosis." The final paper of the evening was presented by Dr. I. H. Alexander, Pittsburgh, "The Effect of Smoke on the Health of Individuals," with particular reference to pneumonia and tuberculosis. All papers stimulated enthusiastic discussion.

Following the dinner, President R. S. Anderson addressed the members of the Chapter. He spoke in great length of the past performances of the Pennsylvania Chapter. He anticipated the aims and ambitions for the future. Dr. Anderson stressed the importance of fraternalism and service. Tentative plans were made for a conference at one of the sanatoria in the eastern part of the State, to be held in the spring. Plans are also under way for the second annual meeting that will be held in conjunction with the Pennsylvania State Medical Society Meeting in Pittsburgh in the fall of 1942.

The same officers were re-elected for the coming year: Dr. R. S. Anderson of Erie, President; Dr. Harry Treshler of Cresson, Vice President; Dr. Edward Lebovitz of Pittsburgh, Secretary-Treasurer.

Edward Lebovitz, M.D.
Secretary-Treasurer.

Ohio Chapter Meets

On October 26th, the fall meeting of the Ohio Chapter of the American College of Chest Physicians was held at The Neil House, Columbus, Ohio.

The meeting began with a luncheon, followed by a short business meeting with Dr. Louis Mark presiding. The changes in the constitution and by-laws were ratified by the Chapter and a resolution was adopted assessing dues of $1.00 per member annually. Dues to be assessed each October. At this time, the State Charter was presented to the Chapter by Dr. Mark, Governor of the College for Ohio. Dr. J. C. Placak of Cleveland, Regent of the College for District No. 5, greeted the new Chapter.

Following the business meeting, Dr. Markwith, State Director of Health, gave an interesting talk concerning the relations of the State Health Department to various phases of the tuberculosis program in Ohio.

(Continued to Page 412)

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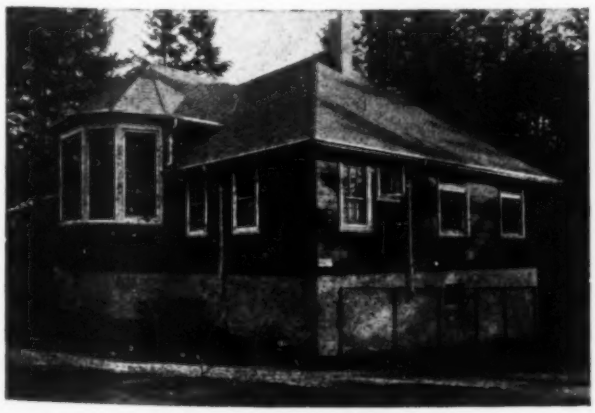

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Dr. M. Rusoff of the State Industrial Board gave a very informative discussion concerning the medical aspects of silicosis.

These discussions were followed by a fine clinical program with Dr. H. G. Curtis of Sunny Acres Sanatorium, Dr. George Kress of Franklin County Sanatorium, and Dr. W. Heusinkveld of Cincinnati presenting a series of unusual and interesting cases. The discussion following the presentation of cases revealed some differences of opinion, especially on treatment. It is hoped that these discussions can be carried on at the next meeting. The meeting adjourned at 4:30 P. M. Thirty-one members and five guests were present at the meeting.

J. B. Stocklen, M. D.
Secretary-Treasurer.

New Jersey Chapter Meets

A meeting of the New Jersey Chapter of the College was held at the Essex House, Newark, New Jersey, on October 23rd.

Minutes of the meeting held at the Hotel Robert Treat on July 8th were read and approved. The revised constitution and by-laws for State Chapters of the College were approved and adopted. In the absence of M. H. Collier, President of the Chapter, because of illness, Dr. C. M. Fish, Vice President of the Chapter, presided.

Charles I. Silk, M.D.
Secretary-Treasurer.

Cuban Chapter Meets

Dr. Antonio Navarrete, Regent of the College for Cuba, reports that a meeting of the Cuban Chapter of the American College of Chest Physicians was held at the Instituto de Vias Respiratorias, Havana, Cuba.

Dr. Rene G. Mendoza and Dr. Rafael Meneses presented a paper on "Lympho-bronchial Fistula" and gave reports of clinical and postmortem findings in two cases. Dr. Teodosio Valledor read a paper on "Military Tuberculosis with Epydidimal Involvement in an Eighteen Months' Child." Dr. Valledor also gave a report on the clinical and postmortem findings. The third paper on the program was given by Dr. Francisco J. Menendez on "Tracheo-bronchial Tuberculosis." He reported on clinical bronchoscopic and x-ray features in several cases.

Illinois Chapter Meets

The Illinois Chapter of the College held a joint meeting with the Chicago Tuberculosis Society at the Bismarck Hotel, Chicago, on November 27th. A short business meeting was held which was presided over by Dr. Otto C. Schlack, President of the Chapter. The minutes of the previous meeting were read and approved. Dr. Julius B. Novak reported for the program committee. The program for the next annual meeting of the Chapter to be held at Springfield in connection with the annual meeting of the Illinois State Medical Society was discussed.

Following the business meeting, dinner was served, and a scientific program was presented before the joint meeting of the Illinois Chapter and the Chicago Tuberculosis Society. Dr. H. C. Hinshaw of the Mayo Clinic, presented a paper on "Chemotherapy in Experimental Tuberculosis."

Darrell H. Trumpe, M.D.
Secretary-Treasurer.

Notice

The Program Committee announces that there are a few places available for the scientific program for the annual meeting of the College to be held at Atlantic City, June 6-8, 1942. Fellows of the College having material available concerning recent important developments in research of medical or surgical problems dealing with chest diseases are invited to send a brief transcript of such material to the Program Committee, 500 North Dearborn Street, Chicago, Illinois.

EVALUATING CHEST SURGERY

(Continued from Page 390)

paraffin pack, the local pack recently devised by Matson, the Monaldi procedure, extrapleural pneumothorax, and other similar methods of collapse therapy. Each one of these may have great value in properly selected and properly managed patients. We should be conversant with all procedures and should finally recommend those which fit the particular indications. Finally, we should lend our criticism with a cool, calculating, judicial temperament.

B. G.

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BOOK REVIEW

ARTIFICIAL PNEUMOTHORAX (Its Practical Application in the Treatment of Pulmonary Tuberculosis.) Editorial Committee Edward N. Packard, M.D., John N. Hayes, M.D., Sidney F. Blanchet, M.D. Copyright Lea & Febiger, 1940.

This book considers the physiological, pathological and technical aspects of artificial pneumothorax as well as its complications, their prophylaxis and treatment. Presented by the Trudeau Foundation it includes the contributions of several physicians whose extensive experience in sanatoria and in private practice has qualiifed them well. The material has been unified and is presented concisely without excessive repetition or loss of continuity.

Improvement might have been made in the selection of illustrative roentgenograms and in their reproduction. However, this is unquestionably a reliable and practical handbook which should prove invaluable to students of pulmonary tuberculosis.

William S. Conklin

NEW BOOKS RECEIVED

Receipt of the following new books are acknowledged in this column. They will be reviewed in the future issues of this journal.

Clinical Heart Disease, by Samuel A. Levine, M.D., F.A.C.P., Assistant Professor of Medicine, Harvard Medical School; Senior Associate in Medicine, Peter Bent Brigham Hospital; Physician, New England Baptist Hospital, Boston. 2nd Edition, 1941, 495 Pages, 109 Illustrations. W. B. Saunders Company, Philadelphia and London, Price $6.00.

The Automatic Nervous System, by James White, M.D., and Reginald Smithwick, M.D. The MacMillan Company, New York City, Price $6.75.

The Heart in Pregnancy and the Childbearing Age, by Burton E. Hamilton, M.D., and K. Jefferson Thomson, M.D. Little, Brown and Company, Boston, Price $5.00.

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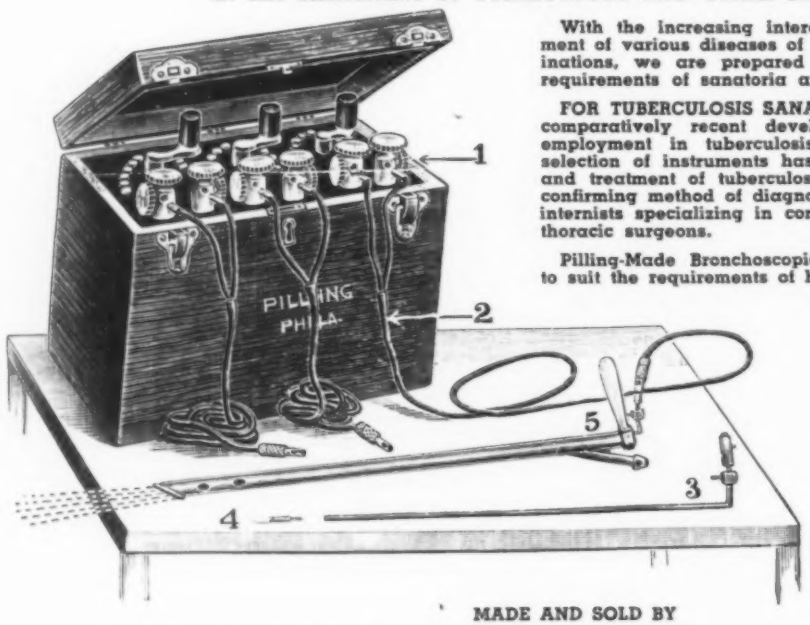

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